

However, as has been noted previously, each of the independent claims recites that the attitude control mechanism is operable to calculate a force applied to the substrate carrier based on a rotational moment and a direction of frictional force that is acting on the substrate carrier, and a contact area where the substrate contacts the polishing surface.

An interview by telephone was conducted with the Examiner on April 12, 2007, and the Examiner is thanked for his courtesy in granting and conducting the interview. The differences between the Watanabe patent and the present invention, as claimed in each of independent claims 44, 49 and 50, were discussed during the interview. In particular, it was argued that Watanabe does not have an attitude control mechanism that is operable to calculate a force applied to the ring based on a rotational moment and a direction of frictional force acting on the ring, and a contact area on the polishing surface. Rather, Watanabe operates through the use of displacement sensors, and not through the calculation of forces based on rotational moment and direction of frictional force, and contact area on the polishing surface. The Examiner indicated that, upon receiving evidence establishing this point, which would be made of record, prosecution would be reopened in order for the Examiner to either find a teaching of the aspects set forth in the independent claims, or the application would be allowed. The Examiner is thanked for his courtesy and careful consideration.

In accordance with the interview, attached hereto is a Declaration Under 37 CFR 1.132 by Yu ISHII, the second named inventor of the present application. Section 1 discusses the relevant claim language. Section 2 discusses the portions of the specification that specifically support the claim language, and describe a specific embodiment of the attitude control mechanism. Thus, this discussion establishes that the attitude control mechanism is operable to calculate a force applied to the substrate carrier based on the rotational moment and the direction of frictional force acting on the substrate carrier, as well as the contact area where the substrate contacts the polishing surface. The Declaration further makes it clear that this is not the way in which the Watanabe patent operates.

The Declaration goes on to discuss that in a first embodiment of Watanabe, displacement in X, Y and Z axis directions, and tilt angles with respect to the X and Y axes, are detected in

order to control the attitude of the top ring and the polishing surface pressure. Note the discussion in column 6, lines 34-39, for example. As discussed in section 5, in a second embodiment the contact pressure is based upon an equation discussed in column 12, line 23.

And, as discussed specifically in section 6, it is seen that Watanabe employs radial sensors 18 and 19, and a thrust sensor 17. These sensors are displacement sensors which detect displacement of rotation shaft 12 in the vertical and horizontal directions. Thus, Watanabe operates by observing the actual displacement of the shaft 12, through which displacement values are obtained. Note column 6. From the displacement values the displacement in the X, Y and Z directions and the tilt angles are obtained. Accordingly, it may be seen that Watanabe employs the actual displacement of the shaft for purpose of control. Watanabe does not calculate the force that is applied to the substrate based upon a rotational moment and a direction of frictional force that is acting on the substrate carrier. Nor is there any consideration of the contact area where the substrate contacts the polishing surface.

It is noted that the first several lines of column 2 in Watanabe, cited by the Examiner, is background to the invention of Watanabe. It discusses the fact that friction force acting on the polishing surface generates a rotational moment M, which produces tilting of the top ring 3. However, this portion of Watanabe is recognizing the cause of the tilting phenomenon, and Watanabe's solution is to employ the displacement sensors as described above. The solution of Watanabe is not to calculate the force that is to be applied to the substrate carrier based upon the rotational moment or the direction of force, or the contact area where the substrate contacts the polishing surface.

The above is clearly established by the accompanying Declaration, and thus, in accordance with the request by the Examiner during the interview, suitable evidence has been made of record establishing the clear distinctions between each of the independent claims and the Watanabe reference that was employed by the Examiner.

Accordingly, it is respectfully submitted that the structure that is recited in each of independent claims 44, 49 and 50, specifically, the attitude control mechanism as recited, is not found in the prior art references that have been cited by the Examiner. Accordingly, withdrawal

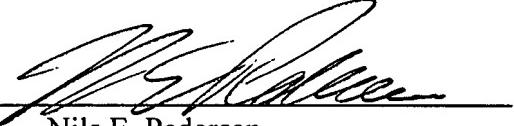
of the final rejection and allowance of the present application, or the issuance of a further Office Action as the Examiner deems appropriate based upon a further search of the prior art is respectfully requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

Norio KIMURA et al.

By:



Nils E. Pedersen

Registration No. 33,145

Attorney for Applicants

NEP/krg
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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